

WHAT IS CLAIMED IS:

1. A measuring gas cell for a device for measuring the concentration of a paramagnetic gas, the measuring gas cell comprising:

a bottom plate carrying a measuring element for the detection of the thermal conductivity of the measured gas, electric leads, an electric measuring gas cell heater and a temperature-dependent electric sensor element for the detection of the temperature of the measuring gas cell;

a channel plate with a cut out forming a gas guide in the area of the measuring element and around the measuring element; and

a cover plate sealing the measuring gas cell in the upward direction, said cover plate having at least two holes for the inlet and outlet of the gas into and out of the gas guide of the channel plate, said bottom plate, said channel plate and said cover plate being provided as connected layers.

2. A measuring gas cell in accordance with claim 1, wherein the leads and the measuring gas cell heater are covered by a non-cut-out area of the channel plate.

3. A measuring gas cell in accordance with claim 1, wherein the measuring element has at least one microstructured heating element and at least one complementary, microstructured, temperature-dependent measuring element for the measured gas.

4. A measuring gas cell in accordance with claim 2, wherein the measuring element has at least one microstructured heating element and at least one complementary, microstructured,

temperature-dependent measuring element for the measured gas.

5. A measuring gas cell in accordance with claim 1, wherein the measuring element is applied to an anesthetic-resistant membrane made of silicon nitride.

6. A measuring gas cell in accordance with claim 3, wherein in the direction of the flow of the measured gas, the measuring element has at least one microstructured, temperature-dependent measuring element each in front of and behind a microstructured heating element arranged at right angles to the direction of gas flow for the determination of the velocity of flow of the measured gas from the measured signal difference of the microstructured, temperature-dependent measuring elements.

7. A measuring gas cell in accordance with claim 5, wherein in the direction of the flow of the measured gas, the measuring element has at least one microstructured, temperature-dependent measuring element each in front of and behind a microstructured heating element arranged at right angles to the direction of gas flow for the determination of the velocity of flow of the measured gas from the measured signal difference of the microstructured, temperature-dependent measuring elements.

8. A measuring gas cell in accordance with claim 1, wherein the bottom plate, channel plate and cover plate consist essentially of a ceramic material.

9. A measuring gas cell in accordance with claim 1, wherein the bottom plate, channel plate and cover plate consist essentially of aluminum oxide.

10. A measuring gas cell in accordance with claim 1, wherein the measuring element is arranged at a spaced location from the bottom plate by means of spacer elements, so that two gaps of approximately equal size are formed above and under the measuring element on the side facing the gas guide for the gas exchange of the measured gas to the measuring element, which takes place essentially by diffusion.

11. A method of using a measuring gas cell for a device for measuring the concentration of a paramagnetic gas, comprising:

providing a bottom plate carrying a measuring element for the detection of the thermal conductivity of the measured gas, electric leads, an electric measuring gas cell heater and a temperature-dependent electric sensor element for the detection of the temperature of the measuring gas cell;

providing a channel plate with a cut out forming a gas guide in the area of the measuring element and around the measuring element;

providing a cover plate sealing the measuring gas cell in the upward direction, said cover plate having at least two holes for the inlet and outlet of the gas into and out of the gas guide of the channel plate;

connecting the bottom plate, the channel plate and the cover plate as layers to form the measuring gas cell;

measuring oxygen in an anesthesia apparatus or respirator using the measuring gas cell.

12. A method in accordance with claim 11, wherein the leads and the measuring gas cell heater are covered by the non-cut-out area of the channel plate.

13. A method in accordance with claim 11, wherein the measuring element has at least one microstructured heating element and at least one complementary, microstructured, temperature-dependent measuring element for the measured gas.

14. A measuring gas cell in accordance with claim 12, wherein the measuring element has at least one microstructured heating element and at least one complementary, microstructured, temperature-dependent measuring element for the measured gas.

15. A method in accordance with claim 11, wherein the measuring element is applied to an anesthetic-resistant membrane made of silicon nitride.

16. A measuring gas cell in accordance with claim 13, wherein in the direction of the flow of the measured gas, the measuring element has at least one microstructured, temperature-dependent measuring element each in front of and behind a microstructured heating element arranged at right angles to the direction of gas flow for the determination of the velocity of flow of the measured gas from the measured signal difference of the microstructured, temperature-dependent measuring elements.

17. A measuring gas cell in accordance with claim 15, wherein in the direction of the flow of the measured gas, the measuring element has at least one microstructured, temperature-dependent measuring element each in front of and behind a microstructured heating element arranged at right angles to the direction of gas flow for the determination of the velocity of flow of the measured gas from the measured signal difference of the microstructured, temperature-dependent measuring elements.

18. A method in accordance with claim 11, wherein the bottom plate, channel plate and cover plate consist essentially of a ceramic material.

19. A method in accordance with claim 11, wherein the bottom plate, channel plate and cover plate consist essentially of aluminum oxide.

20. A method in accordance with claim 11, wherein the measuring element is arranged at a spaced location from the bottom plate by means of spacer elements, so that two gaps of approximately equal size are formed above and under the measuring element on the side facing the gas guide for the gas exchange of the measured gas to the measuring element, which takes place essentially by diffusion.